

AMENDMENTS TO THE CLAIMS

1-14. (Canceled)

15. (Previously presented) A method for electroplating a noble metal into submicron features on a surface of a microelectronic workpiece, the method comprising the steps of:

bringing the surface of the workpiece that is to be plated into contact with an electroplating solution including ions and/or complexes of a noble metal that is to be plated on the surface of the workpiece, the surface being prepared with a metal seed layer of no more than 1000 Angstroms thick;

providing an anode spaced from the surface of the workpiece and contacting the electroplating solution;

applying electroplating power between the surface of the workpiece and the anode using a low current for a first predetermined period of time;

applying higher current electroplating power between the surface of the workpiece and the anode for a second predetermined period of time, the noble metal being deposited into the submicron features during the first and second time periods;

halting application of electroplating power; and

disengaging the surface of the workpiece from the electroplating solution.

16. (Original) A method as set forth in claim 15 and further comprising the step of pre-rinsing the surface of the workpiece prior to bringing it into contact with the electroplating solution.

17. (Original) A method as set forth in claim 16 wherein the surface of the workpiece that is to be plated is pre-rinsed using an acidic solution.

18. (Original) A method as set forth in claim 15 and further comprising the step of spinning the workpiece at a high spin rate to remove excess electroplating solution.

19. (Original) A method as set forth in claim 16 and further comprising the steps of:
rinsing the workpiece in a spray of deionized water for a predetermined period of time;
and
spin drying the workpiece at a high rotation rate.
20. (Original) A method as claimed in claim 15 wherein the electroplating solution includes ions and/or complexes of platinum for deposition on the surface of the workpiece.
21. (Original) A method as claimed in claim 20 wherein the electroplating solution has a platinum concentration of about 10-15 g/l.
22. (Original) A method as claimed in claim 20 wherein the electroplating solution has an elevated temperature in a range between about 40°C and 80°C.
23. (Original) A method as claimed in claim 22 wherein the electroplating solution has an elevated temperature of about 65°C +/-5°C.
24. (Original) A method as claimed in claim 15 wherein the electroplating solution has a pH in a range of about 11-12.
25. (Original) A method as claimed in claim 24 wherein the initial low current is applied using a pulsed waveform.
26. (Original) A method as claimed in claim 25 wherein the higher current electroplating power has a current density between about 3 and 9 mA/cm².
27. (Original) A method as claimed in claim 20 wherein the electroplating solution has a pH in a range of about 2-4.
28. (Original) A method as claimed in claim 27 wherein the electroplating solution has a platinum concentration in a range of about 2-16 g/l.
29. (Original) A method as claimed in claim 28 wherein the higher current electroplating power has a current density between about 20-50 mA/cm².

30. (Original) A method as claimed in claim 29 wherein the higher current electroplating power is applied using a pulsed waveform.

31. (Original) A method as claimed in claim 30 wherein the pulsed waveform comprises an on-time in a range of about 1-10 ms and an off-time in a range of about 1-10 ms.

32. (Original) A method as claimed in claim 15 and further comprising the step of subjecting the surface of the workpiece to a preliminary cleaning process.

33. (Original) A method as claimed in claim 32 wherein the preliminary cleaning process comprises the step of spraying deionized water onto the surface of the workpiece that is to be electroplated.

34. (Original) A method as claimed in claim 33 wherein the deionized water comprises at least one additive selected from the group consisting of an acid and surfactant.

35-43. (Canceled)

44. (New) The method of claim 15, wherein the higher current electroplating power is initiated immediately after the first predetermined period of time.

45. (New) The method of claim 15, wherein the higher current electroplating power is initiated after a thickness of noble metal deposited during the first predetermined time period has increased beyond a predetermined magnitude.